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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/029,035	12/28/2001	Young Ho Bae	3449-0921PUS1	3483
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EXAMINER				
KACKAR, RAM N				
ART UNIT		PAPER NUMBER		
1716				
NOTIFICATION DATE		DELIVERY MODE		
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary

Application No.

10/029,035

Applicant(s)

BAE, YOUNG HO

Examiner

Ram N. Kackar

Art Unit

1716

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 September 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 4-8, 10, 16, 18 and 19 is/are pending in the application.
- 4a) Of the above claim(s) 19 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 4-8, 10, 16 and 18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB-06)
Paper No(s)/Mail Date _____

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Drawings

1. As discussed in the interview dated 8/25/2010, it is suggested that the applicant officially submit drawings which explain load/unload including potential problem with load due to bending of substrate at the edges due to substrate being hot. These drawings were submitted as informal drawings during a previous interview and are being included as appendix with this office action. Additionally two hand made drawings are added to explain load/unload and apparent reasons for load problems.

Election/Restrictions

2. Newly submitted claim 19 is directed to an invention that is independent or distinct from the invention originally claimed for the following reasons:

The invention of claim 19 is directed to a method. Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claim 19 is withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

It is noted that amendment dated 12/5/2005 also tried to submit method claims which were later withdrawn for the same reason.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 4-8, 10, 16 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicants admitted prior art (AAPA) in view of Tepman et al (US 5589224).

Applicants admitted prior art (AAPA) as disclosed in Figs 1 to Fig 4 A, B, C and D and the specification paragraphs 2-23 disclose:

A vacuum deposition apparatus having a process chamber (Fig 1-4A);

a susceptor having a recessed central portion provided with lift pins and raised perimeter portion acting as a sliding portion on which to slide the substrate toward a stopped position by stopper pins placed on the sliding portion (Fig 3 28 and 4A);

The limitation "means for positioning the glass or quartz substrate into contact with the susceptor at a non-parallel angle to a top surface of the susceptor and for permitting edges of the glass or quartz substrate to slide along a raised perimeter portion of the susceptor toward stopping pins until the glass or quartz substrate is substantially parallel with the susceptor" appears to invoke Sec 112 sixth paragraph convention. According to the specification the structure disclosed for this function is the lift pins supporting the substrate which move relative to the susceptor so that bent (non-parallel) edges of the substrate get straightened when fully supported by the susceptor (Please see the explanation of drawings of the Appendix).

This structure is disclosed by AAPA.

The limitation "without incurring contact of the glass or quartz substrate with a build up of vacuum deposited material on the raised perimeter portions of the susceptor" points to groove

in the raised perimeter portion. As discussed further this feature is disclosed in Tepman et al and DuBois et al.

AAPA further discloses that the sliding portion on the raised perimeter portion, is about 5 mm (Fig 3 and description).

AAPA does not disclose a groove to collect material disposed on the susceptor and increased dimension of the sliding part from 5mm to 10 mm.

Tepman et al disclose a vacuum deposition apparatus for PVD, CVD, sputtering, ion implanters etc (Col 1 lines 10-19), lift pins (Fig 1-30), robot arm (Fig 4 and Col 2 lines 13-16), stopping pin (40 being used to align the substrate) and groove around susceptor to collect deposition so that build up on the surface of the susceptor may not cause problem by sticking to the substrate (Fig 3-38 and Col 4 lines 54-63).

Therefore it would have been obvious for one of ordinary skill in the art at the time of invention to have grooves on the susceptor of AAPA in order to avoid problems of substrate sticking.

Regarding increasing the sliding distance from 5mm to 10mm, since except for the groove prior art discloses all the other apparatus features it would be obvious to optimize the width of the sliding portion to prevent failures caused by misaligned loading of the substrate.

Regarding the shape of the grooves: It was held in *re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966) that the shape was a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular shape was significant. (Also see MPEP 2144.04(d)).

Similarly, *regarding change in size/proportion*: It was held in *re Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984) that where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device.

6. Claims 4-8, 10, 16 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicants admitted prior art (AAPA) in view of DuBois et al (US 5855687).

AAPA is discussed above.

DuBois et al like Tepman as above disclose a vacuum deposition apparatus for CVD with heatable susceptor (Col 3 line 22-42 and lines 38-40), lift pins and robot arm (Col 5 lines 49-51), groove around susceptor to collect deposition so that build up may not cause problem by sticking to the substrate (Col 4 lines 43-48). Further, entire area inside the groove is available as a sliding part.

Therefore it would have been obvious for one of ordinary skill in the art at the time of invention to have grooves on the susceptor in order to avoid problems of substrate sticking.

7. Claim 4 is also rejected under 35 U.S.C. 103(a) as being unpatentable over (AAPA) in view of Tepman et al (US 5589224) or alternatively in view of DuBois et al (US 5855687) as applied to claims (4-8, 10, 16 and 18) and further in view of Rempei Nakata (US 5119761).

Tepman et al and DuBois et al as discussed above do not disclose the susceptor to be made of Quartz.

Quartz susceptors are common for thermal processing for its thermal insulation properties.

Rempei Nakata discloses a quartz susceptor (Fig 12-106 and Col 1 lines 44-49).

Therefore it would have been obvious for one of ordinary skill in the art at the time of invention to have a susceptor of quartz for its excellent thermal properties of insulation.

Description of load/Unload and apparent causes of load problems.

1 The robot brings a substrate above the pins extended over the susceptor and places it over the pins. (Slide 4, 5 and 6).

2 As the glass substrate is hot it may bend as depicted in Slide 6 and Slide 9 added by the examiner to explain how this bending could cause problem.

3 After glass substrate is placed on the pins, pins retract so that the bent edge may contact the susceptor raised perimeter portion first. As the pins continue to retract the edges slide outward toward the stopper pins. If everything is ok the substrate becomes flat and sits on the substrate as depicted in slide 7.

4 However the last step could fail if at least one stopper pin is too close to the edge of the substrate (Slide 10) or at least one substrate edge is close to susceptor edge to prevent free slide of the bent portion during lift pins retraction. (Slide 9).

5 It would appear to one of ordinary skill in the art that the two scenarios of load failure would be caused either by substrate not being aligned properly on the lift pins or the

width of the raised portion not sized properly or a combination of the two and that the failure could be prevented or reduced by increasing/optimizing the size of the sliding portion.

Response to Amendment

Applicant's arguments filed 9/7/2010 have been fully considered but they are not persuasive.

The Applicant's argue that disclosed conventional art susceptor does not include any groove and does not contain a disclosure of how to improve stable transfer of the glass or quartz substrate to a susceptor, although Applicant does disclose that the conventional art apparatus causes a "slide miss" such that the glass substrate 4 is broken due to a severe bend of the glass substrate.

In response it is noted that Tepman et al and Dubois are used mainly for the teaching of grooves. Further, as explained later, it would have been obvious for one of ordinary skill in the art to optimize the sliding area from 5mm to within 3-10mm.

The applicant argues that according to specification paragraph 19 when the sliding distance (Stopper pin to where the substrate edge contacts the susceptor raised surface) is 5mm the unload is a failure.

In response it is noted that after reading the paragraph one does not get this impression. It appears that when the distance is 2~3 mm there may be a problem and when it is 5 mm it is placed safely. Further paragraph 40 states that the robot arm 35 positions the glass substrate 34 at a location 2~3 mm before the stopper pin 40 from the end of the glass substrate 34 when safely placing the glass substrate 34 on the surface of the susceptor 30.

It is noted again that the language of the specification is not clear at many places and this fact has been brought to the attention of the Applicants several times before.

Applicants argue that while Tepman discloses a groove which is used to permit additional buildup of deposited material relative to the planar configuration along the edge of substrate without the material sticking to the substrate and without interfering with the positioning and orientation of the substrate on the pedestal, and shows centering pins in the groove (Col. 7, lines 36-51), Applicant cannot find any disclosure in Tepman wherein a length of said raised perimeter portion, measured from a stopper pin to a contact position of the glass or quartz substrate on the top surface of the susceptor is about 10 mm to stabilize transfer of the glass or quartz substrate to the susceptor, as claimed. Applicant present similar argument against Dubois.

In response it is noted that Tepman et al and Dubois are used mainly to provide a teaching of groove. However it would be apparent from these references that problems of load would be less severe if enough space is available for sliding to take place.

Applicants argue that only when one teaches paragraph [0027], which discusses Applicant's invention, is the 10 mm gap, that solves the unstable transfer problem disclosed. The solution to the unstable transfer problem is clearly not part of Applicant's disclosed conventional art, nor does the conventional art disclosed by Applicant include an indication that the length of the sliding area is a result-effective variable at all, let alone to solve unstable transfer of a substrate to a susceptor.

In response it is noted that the sliding distance is in fact result effective variable.

It is noted that since there is a large recess in the center of the susceptor and the raised perimeter has stopper pins projecting upwards and the substrate is designed to be loaded to rest

on the raised perimeter before the stopper pins, its width is important not only for load purposes as explained before but also for support during process. It is noted that the substrates being hot may have a tendency to sag if adequate support is not provided. Further the substrate should be supported uniformly for uniform processing and improper load will not provide uniform placement.

Regarding hindsight reasoning it is established that so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such hindsight reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

It is noted that since the type of load/unload using robot arm and lift pins with a susceptor having stopper pins and large recess was known in the prior art one of ordinary skill in the art would understand the issues of alignment and potential load/unload problems.

Equipment engineers (One of ordinary skill in the art) routinely adjust/optimize apparatus dimensions to accommodate different substrates or slightly changed process conditions. This type of optimization has been held obvious.

Applicants state that the slides filed in this application on June 12, 2009, show that when a substrate with bent ends is placed in contact with a susceptor the ends tend to straighten out and slide along the top surface of the susceptor with respect to which the ends of the heated substrate come into contact.

Applicant argues that this feature is not found in the conventional art, as disclosed in this application as originally filed. Accordingly, the disclosure of Fig. 6 cannot be properly used

against Applicant to render the claimed invention obvious. Only Applicant, as part of disclosing his invention, indicates that the transfer of the heated substrate to become unstable due to the length of the gap feature recited in the claims, and this disclosure cannot properly be used against the Applicant.

In response it is noted that the specification has been so deficient in explaining the load/unload apparatus and its working that it was hard to understand the proper context of the claimed invention (See the prosecution history and many alternative modes of load/unload proposed- like bent robot arms). The Applicants are thanked for the slides submitted informally and the latest amendment to the specification which have clarified the context greatly if not completely. As requested on 8/28/2009 the informally submitted drawings have yet to be submitted formally.

It appears that the Applicants are referring to Slide 6 and not Fig 6 where bending of the substrate is shown. Contrary to Applicant's contention this bending of substrate is not a feature of the claimed apparatus or of the prior art. It is only related to the use of the apparatus.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ram N. Kackar whose telephone number is 571 272 1436. The examiner can normally be reached on M-F 8:00 A.M to 5:P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571 272 1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Ram N Kackar/
Primary Examiner, Art Unit 1716

